generator also includes a pair of output terminals each having a brush at one end for electrical connection to the charge plates on one of the disks. Upon counter-rotation of the pair of disks, the grounding conductors ~~induce~~ neutralize each charge plate to accumulate a logarithmically-increasing charge until they are discharged to the next output terminal.

Beginning at page 6, line 20, and running to page 6, line 21, delete the existing paragraph and replace it with the following paragraph:

FIG. 3A and 3B is a schematic representation of the above-described electrostatic generator 3A shown side-by-side with a conventional Wimshurst generator 3B for illustration.

Beginning at page 7, line 1 and running to page 7, line 2, delete the existing paragraph and replace it with the following paragraph:

FIG. 4 is a horizontally exploded side perspective view illustrating a completed mechanical assembly for implementing the above described generator of FIG. 2.

Beginning at page 7, line 4 and running to page 7, line 5, delete the existing paragraph and replace it with the following paragraph:

FIG. 6A and 6B are ~~is an~~ examples of unacceptable variations on the generator of FIG. 2 in which the number of charge plates 11, 12 on each disk produce conflicting polarities. Conflicting polarities means that pairs of opposing charge plates 11, 12 have the same polarity.

Beginning at page 7, line 7 and running to page 7, line 10, delete the existing paragraph and replace it with the following paragraph:

FIG. 7A and 7B are ~~is an~~ examples of acceptable variations on the generator of FIG. 2 in which the number of charge plates 11, 12 on each disk do not produce conflicting polarities. Conflicting polarities occur whenever the number of charge plates per disk, 10, 20 are double an even number.

Beginning at page 7, line 12 and running to page13, line 1, the section entitled "Detailed Description of the Preferred Embodiments" is deleted and replaced with the following section:

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to FIG. 2, a preferred embodiment of an improved electrostatic generator is shown according to my invention. Ten charge plates ~~30-39~~ 50-59 are uniformly spaced around a first rotating disk , 10 and ten charge plates ~~40-49~~ 60-69 are uniformly spaced around a second counter rotating disk 20. The charge plates are conveniently represented by a series of condensers arranged in two circles. As the two disks 10, 20 counter-rotate, a pair of opposing charge plates ~~37~~57, ~~47~~67 on disks 10, 20 will contact output connector 160 at the same time that an opposing pair of charge plates ~~37~~57, ~~47~~67, will contact output connector 170. The contact with the foregoing and all other charge plates ~~30-49~~ 50-69 is accomplished via twelve identical contact brushes 130-141. Four grounded neutralizing brushes 131, 135,137 and 141 are in operative contact with the respective charge plates ~~41,44, 46, 49~~ 61, 64, 66, 69 on disk 20. Similarly, four grounded neutralizing brushes 130, 134, 136 and 140 are in operative contact with the respective charge plates ~~30, 33, 35 and 38~~ 50, 53, 55 and 58 on disk 10. With this

configuration, all charge plates on each disk that are not in contact with output connectors 160, 170 are alternately either grounded or left open. Thus, as charge plates ~~37,47~~ 57, 67 on disks 10 and 20 are contacting output connector 160 and charge plates ~~37, 47~~ 57, 67 on disks 10, 20 are contacting output connector 170, charge plates ~~30, 33, 35 and 38~~ 50, 53, 55 and 58 around disk 10 are grounded by respective brushes 130, 134, 136 and 140. Likewise, charge plates ~~41,44, 46 and 49~~ 61, 64, 66 and 69 around disk 20 are grounded by respective brushes 131, 135, 137 and 141.

In contrast to dual-energy producing system as shown in FIG. 1 (prior art), the present invention employs multiple energy producing systems. With reference to the top center area of FIG. 2, as the disks 10, 20 counter-rotate, opposite charge plates ~~30, 40~~ 50, 60 pass and a net charge on one will induce an opposite charge in the other, resulting in a net gain in electrical energy (a conversion of mechanical to electrical energy). Ungrounded charge plates ~~31, 43, 45, 36, 48, 39 and 40~~ 51, 63, 65, 56, 68, 59 and 60 determine the polarity of each sector. Thus, for example, as the charge plate ~~40~~ 60 subsequently encounters brush 131, this permits contact allowing electrons to be transferred to ground to balance the charges and maintain the increased energy of the new position. This subcycle repeats as the disks 10, 20 rotate. With each new position there is a net gain of energy, e.g., an increase in the number of electrons within each charge plate ~~30, 40~~ 50, 60. Thus, brushes 130, 131, 134, 135, 136, 137, 140 and 141 increase the charge on the contacting plates before the plates reach the collector output connectors 160, 170. The charging cycle continues until the charge plates ~~30, 40~~ 50, 60 make contact with the next terminal output connectors 170. Terminal connectors 160, 170 receive the same charge polarities

from both disks 10, 20 as they turn in opposite directions. Both disks 10 and 20 must turn in order to renew charges on all charge plates ~~30-49~~ 50-69. For example, if one disk 10 or 20 ceased to turn, charge plates ~~30, 40~~ 50, 60 would soon lose their charge and there would be nothing to produce a charge on either disk 10 or 20.

It follows that the greater the number of charge plates and brushes, the higher the induced voltage on the collector output connectors 160, 170. Since ungrounded charge plates ~~31,43, 34, 45, 36, 48, 39 and 40~~ 51, 63, 54, 65, 56, 68, 59 and 60 determine the polarity of each sector, it also follows that an even number of sectors leaves one positive output connector 170 and one negative 160.

It should be apparent from the foregoing that the number of charge plates may vary. However, one important constraint is that the number of charge plates on each disk 10, 20 must be twice an odd number. Otherwise, opposing charge plates may have the same polarity, and this tends to kill any increase in voltage. Thus, any multiple of an odd number such as 6, 10, 14, 18... will avoid this problem. In other words (and in terms of sectors), the number of sectors should not equal the double of any even number, whereas the double of any odd number will avoid such problems.

FIG. 3A is a schematic representation of a fourteen-sector electrostatic generator as described above, with a conventional Wimshurst generator shown in FIG. 3B for comparison. If the disks, 10, 20 are turned mechanical energy is transferred to the system. With reference to FIG. 3A, the mechanical energy is converted to electrical energy as electrons flow toward the grounded charge plates ~~40, 49~~ 60, 69 etc. in an attempt to maintain angular position. This is true

despite the fact that alternate charge plates ~~40, 49~~ 60, 69, etc. have a common ground. As the non-grounded charge plates ~~30, 39~~ 50, 59 etc. move away from the illustrated position they carry the extra electrons with them, so they gain electrical energy by virtue of being separated from the oppositely charged plate. In this manner, every single charge plate becomes progressively charged and eventually releases its charge to the output terminals 160, 170. The increase of charge on each charge plate ~~30, 40~~ 50, 60 is a multiple of its previous charge. Hence, the cumulative increase in charge follows a logarithmic pattern rather than linear. Contrasting the conventional Wimshurst generator of FIG. 3B, there is only one pair of grounded brushes 112, 114 and 132, 134 per disk 10, 20, respectively. With fewer charging plates ~~30, 40~~ 50, 60 to transfer energy, each charge plate ~~30, 40~~ 50, 60 simply gains an incremental charge and then discharges it during each cycle. There is no logarithmic building of charge, and clearly the conventional Wimshurst generator is less efficient because it does not use all of its energy conversion ability. The key difference is the use of multiple grounding conductors (and associated brushes) per disk with the realization that these conductors may be commonly grounded and still they will allow the charging plates to accumulate charge according to a logarithmic pattern.

FIG. 4 is a horizontally exploded side perspective view illustrating a completed mechanical assembly for implementing the above described generator of FIG. 2. Horizontal dimensions are enlarged for illustrative purposes. The assembly includes a box frame container 1. The box frame container 1 supports two rotatable shafts 2, 3. A hand crank 4 turns shaft ~~3~~ 2, and a large drive wheel 5 turns shaft ~~2~~ 3. Drive pulleys 6, 7 and 8 are mounted on shaft 2. The

two disks 10, 20 containing respective charge plates 12 (not shown) and 22 are mounted on shaft 3. Charge plates 12, 22 are evenly disposed around both disk's 10 and 20, and face each other . A central partition 24 passes between disks 10 and 20. This partition 24 is formed with a hole 13 that encircles shaft 3. A conductive metal ring 14 encircles the inner edge of the hole 13. Conventional bearing collars 18 are used as desired to rotatably support shaft 3 and to roll against the surfaces of disks 10, 20. Preferably, three bearing collars 18 are used, one between the two disks 10, 20 and the others on the opposite sides of the disks 10, 20. The middle collar 18 should be thick enough to provide space for disks 10, 20 to clear brushes 15, 16. The outer bearing collars 18 hold disks 10, 20 in place, and conventional spacers such as spacer 19 may be used to achieve the proper clearances. Spacer 19 abuts box frame 1 and pulley 5. Legs 27 support frame 1. Note that belt 21 is crossed in order to counter-rotate disks 10, 20 upon operation of hand crank 4.

FIG. 5 is a front detailed illustration of the metallic ring 14 of FIG. 4, which is segmented as shown in order to isolate two output terminals 22 and 23 from a plurality of conductive brushes 15, 16. Brushes 15 are situate on one side of the ring 14, and brushes 16 are on the opposite side of the ring 14. The brushes 15, 16 may have a common ground, but this is not necessary inasmuch as only the charge plates 11 (see FIG. 4) carry the induced charge. The insulated output terminals 22 and 23 have brushes on both sides of the ring 14 in order to pick up charges from all charge plates 11, 12 on disks 10 and 20, respectively (see FIG. 4). Conductive ring 14 may be formed aluminum foil or otherwise painted with metallic paint (metallic paint is a poor conductor for low voltage, but adequately conducts a high-voltage current). The brushes 15,

16 may be attached cylinders of rolled paper covered with an electrically conductive coating of metallic paint or aluminum foil. The two disks 10, 20 (Fig. 4) make contact with the brushes 15, 16 so that the charge plates 11, 12 on respective disks 10, 20 can pick up the charge. Alternate charge plates 12 on disk 10 (Fig. 4) are grounded by the brushes 15, and alternate charge plates 11 are isolated. The isolated charge plates 11 carry a charge which induces electron flow into the brush connected plates 12 on the opposite disk 10 as described above.

The mechanical configuration of FIGs. 4 and 5 is one simple and efficient way to achieve the progressive charge accumulation described above with reference to FIG. 2.

In both mechanical configurations, it is critical to have an acceptable number of charge plates 11, 12. The wrong number will cause conflicting polarities which will defeat voltage output.

FIG. 6 A and B illustrates two embodiments with an unacceptable number. In FIG. 6A there are 8 sets of charge plates 11, 12 on each disk, thereby yielding 8 voltage producing sectors. This would result in two sectors (circled) having opposing polarities. Similarly, in FIG. 6B there are 12 sets of charge plates 11, 12 on each disk, thereby yielding 12 voltage producing sectors two of which (circled) having opposing polarities.

On the other hand, FIG. 7 A and B illustrates two embodiments with an acceptable number. In FIG. 7A there are 10 sets of charge plates 11, 12 on each disk, thereby yielding 10 voltage producing sectors and no conflicting polarities. Likewise, in FIG. 7B there are 14 sets of charge plates 11, 12 on each disk, thereby yielding 14 voltage producing sectors and no conflicting polarities. As a general rule, the number of charge plates/sectors should not equal the

double of any even number as this will cause conflicting polarities, whereas the double of any odd number will avoid such problems and produce no conflicts.

Having now fully set forth the preferred embodiments and certain modifications of the concept underlying the present invention, various other embodiments as well as certain variations and modifications of the embodiments herein shown and described will obviously occur to those skilled in the art upon becoming familiar with the said underlying concept. It is to be understood therefore, that the invention may be practiced otherwise than as specifically claimed herein.

IN THE CLAIMS

Please amend the claims as follws:

Claim 1 (currently amended) An electrostatic generator comprising:

a pair of counter-rotating disks inclusive of a first and second disk;

a plurality of charge plates angularly disposed about each of said first and second disk;

said plurality of charge plates numbering double an odd integer;

a plurality of grounding brushes associated with each of said disks and connected to ground, said grounding brushes being positioned to make rotational contact with corresponding alternate charge plates on each disk;

a pair of output terminals, each output terminal having a brush at one end for electrical connection to the charge plates on one of said disks;

whereby upon counter-rotation of said pair of disks, said grounding means induces each charge plate to accumulate a logarithmcally-increasing charge until discharged to said

output terminals.

Claim 2 (currently amended) An electrostatic generator comprising:

first and second nonconducting disks, rotatably mounted about a common principal axis, said first disk having a plurality of conducting sectors, and said second disk having an equal number of conducting sectors;

said plurality of conduction sectors numbering double an odd integer;

first and second charge collecting means, said first charge collecting means comprising a first contact with said first disk, a second contact with said second disk, and a first conductor, said second charge collecting means disposed opposite to said first charge collecting means and comprising a first contact with said first disk, a second contact with said second disk, and a second conductor;

charge balancing means comprising a first grounded brush for contacting said first disk, a second grounded brush for contacting an opposing portion of said first disk, a third grounded brush for contacting said second disk, and a fourth grounded contact for contacting an opposing portion of said second disk;

means for mechanically engaging said disks, wherein said first disk rotates about the principle axis in opposite direction to said second disk;

mechanical input means for contra-rotation of the disks.

Claim 3 (original) The electrostatic generator of claim 2, wherein said charge balancing means further comprises a conductor electrically inter-connecting a plurality of contacts with said first disk, and a conductor electrically inter-connecting a plurality of contacts

with said second disk.

Claim 4 (original) The electrostatic generator of claim 2, wherein said charge balancing means further comprises a plurality of conductors each connecting a pair of contacts with said first disk, and a plurality of conductors each connecting a pair of contacts with said second disk.

Claim 5 (original) The electrostatic generator of according to claim 2, wherein said means for mechanically engaging said disks is a manual crank.

REMARKS

This amendment is being submitted in response to the Office Action dated 13 June 2003, the time to respond being until 13September 2003. Reconsideration and allowance of this application are also respectfully requested.

The examiner objected to the drawings because they fail to show how the bearings support the shaft when they are not in contact with the disks 10, 20 or any supporting structure, how the outer bearing collars hold disks 10, 20 in place, or how the center bearing 18 supports the shaft. The applicant's drawing change authorization request, submitted herewith includes an amended FIG. 4, which is re-characterized as an exploded view of the box frame containing the mechanical structure necessary to practice the invention. The change is intended to clarify the depiction of the elements in a separated position, for purposes of viewing, with the understanding that the actual structure is horizontally compacted. The bearing collars support the shaft as

shown and also contact and rotatably support the disks. The change in the description of Figure 4 is incorporated into the specification with consistent additions by this amendment.

The examiner noted that Figure 3B should be designated as "prior art". The drawing change authorization request incorporates this change.

The examiner objected to the drawings because the reference numerals 31-49 appear in the prior art drawings and reappear in the drawings of the applicant's invention to designate charge plates. The drawing change authorization request corrects Figures 2 and 3A to renumber the charge plates using numerals 40-69. The changed reference numerals are corrected in the text of the Detailed Description of the Preferred Embodiment by this amendment.

The examiner objected to the brief description of the drawings for failure to include the separate "letter" designations on certain drawing figures, such as 3A and 3B. This amendment corrects the labels for Figures 3A, 3B, 6A, 6B, 7A and 7B. Appropriate changes in the text of the specification are made, by this amendment, to clarify the references to the drawings, as labeled. The amendment to the brief description of the drawings and the text amendments clarify the description of the drawings and the text references to the drawings. It is not necessary to amend the drawings to satisfy the examiner's objection, in this regard.

The examiner rejected Claims 1-5 as being drawn to an inoperable device, in that the grounded brushes induce a charge on the plates. The specification has been amended to remove the induction of charge by grounded brushes and to state that the grounded brushes neutralize the plates. The device repeatedly performs a function similar to that depicted in the physics book cited by the examiner to more fully neutralize the plates before applying an opposite charge. The

term "net energy gain" is clearly restricted to a gain in electrical energy with mechanical energy as its source and not a violation of the law of conservation of energy.

The examiner rejected Claims 1-5 as containing subject matter not described in the specification. Again, this rejection relates to the suggestion that the grounded brushes induce a charge on the charge plates. This amendment has deleted the language saying that the grounded brushes induce a charge on the plates and clarified the function as neutralizing the charge on the plates. The counter-rotation of the plates which repeatedly brings the plates into contact with grounded brushes more fully neutralizes the charge on the plates before they pass a charge plate, on the opposing disk, and begin to accumulate an opposite charge. The reference to "net energy gain" is clearly related to a gain in electrical energy by conversion from mechanical energy and not a violation of the law of energy conservation. The deletion of the language related to the induction of a charge by contact with a grounded brush changes the context of the description of a net energy gain and leaves a clear representation that the gain in energy is a gain in electrical energy and not a violation of the law of energy conservation.

The examiner rejected Claims 1-5 as not including the critical or essential number of plates needed for the practice of the invention. Claims 1 and 2 have been amended to include a limitation specifying the number of charge plates within the parameters critical to the invention. Claims 3-5 depend on claim 2; therefore, the added limitation is incorporated to satisfy the examiner's requirement as to all pending claims.

The examiner required a working model of the invention. As the applicant's attorney has mentioned in a telephone interview, the applicant is 95 years of age and has constructed the

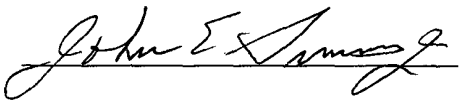
invention in the basement of his home. The size and location of the invention, together with the applicant's advanced age make it difficult to provide a working model. The applicant requests that the examiner give consideration to the circumstances described and withdraw the requirement of a model. In addition, this amendment, which deletes language raising a question of the law of conservation of energy may provide further reason for relief from the requirement of a model.

The examiner rejected claims 1-5 as being obvious based on AAPA in view of Tudsbury. The invention makes use of the principal of the Wimshurst generator and presents an improvement which is not taught by the prior art. The process of repeatedly contacting a charged plate with a plurality of grounded brushes serves to more fully neutralize the charge on a particular plate so that the plate may more readily accumulate the opposite charge in the succeeding cycle, of the device. The use of multiple brushes leads to the use of multiple plates. As demonstrated by FIGs.6A and 6B the use of an incorrect number of plates can cause opposite polarities causing the device to attenuate the electrostatic charge, as the device operates. The applicant has disclosed and claimed an improved configuration to make use of a plurality of brushes and a plurality of plates, of correct number, to accentuate the accumulation of electrostatic charge on the plates. The cited references do not disclose this attribute of the invention.

* * *

In view of the above amendments and remarks, it is believed that this application is now in condition for further examination and further consideration is respectfully requested.

Respectfully submitted,



John E. Simms Jr.
Attorney for Applicant
Reg. No.37,559

10 September 2003
Date

Law Offices of Royal W. Craig
10 North Calvert Street
Suite 153
Baltimore, MD 21202
(410) 385-2383

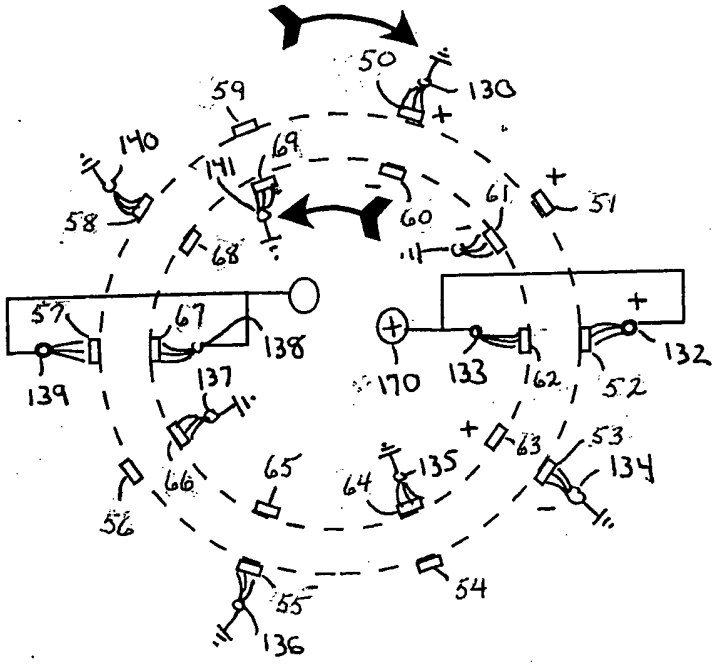


Fig. 2

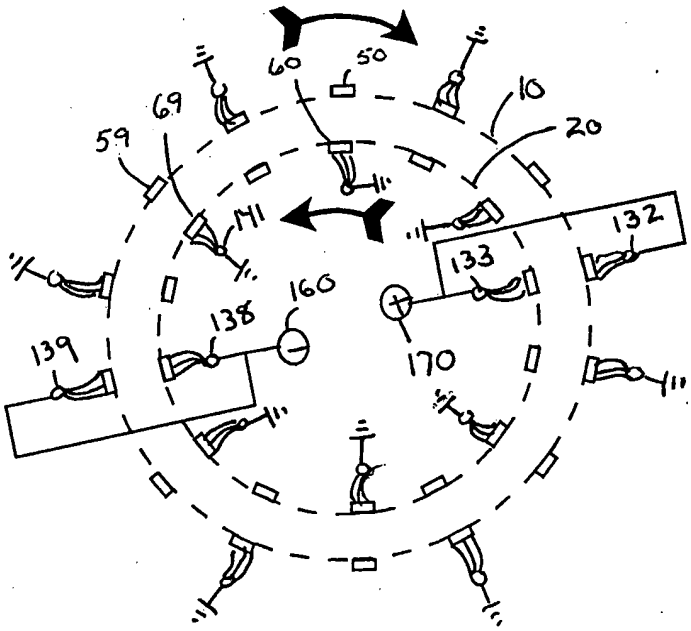


Fig. 3A

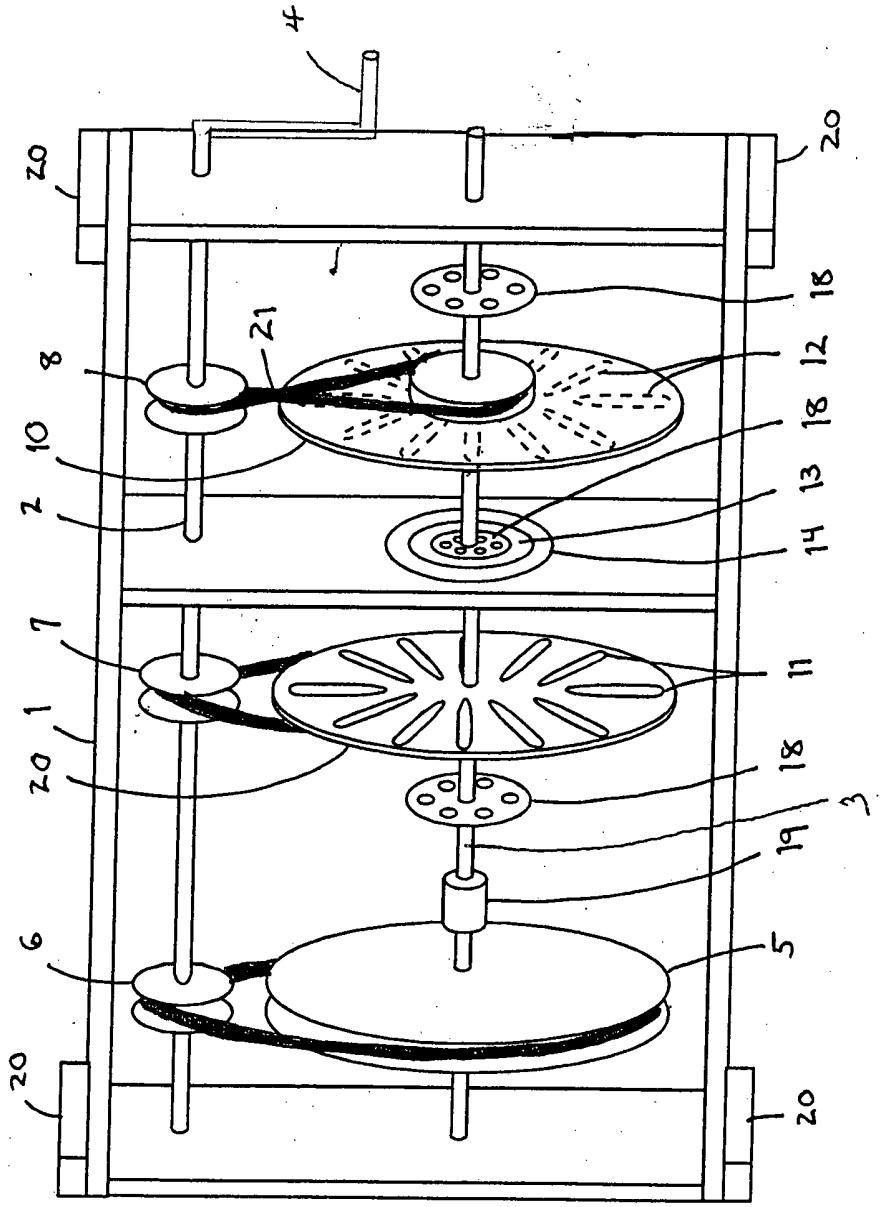


Fig. 4